9
69P
Mrs Krupp.
U.S.D.A. Library

THE PLANT DISEASE REPORTER

LIBRARY
RECEIVED
★ AUG 27 1934 ★
U. S. Department of Agriculture

Issued by

THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XVIII August 15, 1934 Number 10

BACTERIAL WILT OF CORN IN 1934

Neil E. Stevens

That Stewart's disease or bacterial wilt of corn (Aplanobacter stewarti) is very much less severe and widespread in 1934 than in 1932 and 1933 is agreed by all observers. Determining the actual amount of reduction in severity of the disease is rendered more difficult by the rapid replacement in many sections of the most susceptible varieties of sweet corn by more resistant sorts, especially the already widely known and appreciated Golden Cross Bantam.

In an endeavor to determine the extent of the disease this year and particularly its severity as compared to previous years, a careful survey was made of certain early sweet corn growing regions of New York, New Jersey, and New England, in which the incidence of the disease in 1932 and 1933 were known. The work was, of course, greatly facilitated by the general interest in the disease and by the active cooperation of various State pathologists and County Agents. The following specific records of disease incidence in individual localities are here recorded for the purpose of comparison with earlier years and so far as may be practical with subsequent years.

NEW HAMPSHIRE: In 1933 isolated cases of infection were found in 8 towns, the most northerly of which was Grafton. In July, 1934, no disease was found in the course of a survey over approximately the same route.

MASSACHUSETTS: Selected as "indicator" localities the general regions about Westfield, West Springfield, Amherst, Sunderland, and Waltham.

Westfield: Variety Whipple's Yellow, from the same seed planted in 1933. Losses heavy (at least 25 per cent) last year. Only a trace this year, three diseased plants found in several acres.

West Springfield: Golden Sunshine, heavy losses from Stewart's disease last year. None found this year.

Sunderland: The farm where the first case of the disease was found in 1932. Bad in 1932 and 1933. None found in 1934.

Waltham and Vicinity: Common in commercial and experimental plantings in 1933. Rare or absent in 1934, found in one field in Wayland.

Dr. Boyd considers that in Massachusetts the disease was 5 to 10 times as bad in 1933 as in 1932, not only in extent of disease and number of plants infected, but in actual loss to growers.

CONNECTICUT: Selected as indicator localities Milford, Westville, Hamden, and Mt. Carmel.

At Milford are located among other plantings the breeding and test plots of the Associated Seed Growers, including a number of Golden Bantam inbreds. All of these - many of which were almost 100 per cent infected in 1933 - were free from disease in 1934.

At Mt. Carmel in variety Golden Gem the maximum infection was 3 per cent and the average much less, with no evidence of secondary spread. 100 per cent infection last year in the same variety in the same place.

North Haven: One grower, Variety Early Surprise, 90 per cent loss last year. None this year.

West Haven: The disease was so severe in 1932 and 1933, that no crop was obtained from the earliest plantings. Less than 1 per cent infection this year.

Hamden: Golden Gem. Heavy losses in 1932 and 1933, but only 1-1/2 per cent in 1934.

Dr. Clinton and Dr. Dunlap agree that in 1933 the disease was more severe and losses to growers heavier than in 1932.

NEW YORK: Selected as "indicator" localities sweet corn growing portions of Rockland, Ulster, and Albany Counties.

Rockland County: General corn acreage much reduced this year because of previous losses from disease. Probably no grower has as much sweet corn in 1934 as in the earlier years. In 1932 over 300 acres of sweet corn plowed under in this County because of wilt.

New City: Variety Whipples. Losses on early plantings over 60 per cent in 1933, but only 1 to 2 per cent wilt this year.

Blauvelt: Variety Early Mayflower. 90 per cent loss in 1933. Same variety in same field certainly not over 0.5 per cent this year.

Ulster County: Rondout Valley. Several growers. Varieties Golden Gem, Golden Sunshine, and Gill's White which were practically wiped out in 1932-1933, this year showed from 0.5 to 2 per cent dying plants.

Kingston Flats. Several growers. Same varieties as above. Heavy losses last year. Could find no disease this year.

Albany County: Losses last year 100 per cent in some plantings of one variety. No single instance of the disease found this year although 53 different sweet corn patches were visited.

Summary of results of July, 1934, survey for Stewart's disease in New York and New England. No case of disease found north of Ulster County, New York, Westfield, and Wayland, Massachusetts. Average loss less than 2 per cent in infected fields of susceptible varieties north of New York City. Most fields in this area show no infection whatever.

NEW JERSEY: So far as the writer is informed the most accurate basis for comparison of the relative incidence of the disease during the past three years in New Jersey is in the experimental plantings at New Brunswick under the direction of Dr. C. M. Haenseler.

Here a considerable number of varieties have been grown for the past three years in the same plots and careful comparative notes have been kept. These will no doubt be available in detail but a typical example of the difference in the several years is that Golden Gem which showed 100 per cent infection in 1933 showed only 30 per cent in 1934, including secondary infection. In Dr. Haenseler's estimate the disease was about equally serious in 1932 and 1933, but actual losses to growers were much less in 1933 due to the replacement of susceptible varieties by those more resistant.

WESTERN MARYLAND AND ADJACENT PENNSYLVANIA: Bacterial wilt is common on susceptible varieties in the regions about Frederick, Maryland, and Gettysburg, Pennsylvania. Five per cent infection was noted in several fields of white sweet corn near Frederick, on August 7. In small plantings of Golden Bantam near Gettysburg and Fayetteville, Pennsylvania, practically every plant was infected, while 40 per cent and 50 per cent respectively were killed before ears had formed.

VIRGINIA (northern portion): In Arlington and Fairfax Counties, Virginia, Stewart's disease seems to be as severe as in 1932 and 1933. In certain gardens where Golden Bantam has been grown each year the losses are greater this season. At Arlington Farm two lots of Golden Bantam grown from seed produced in Maine and Idaho showed, on August 2, practically every plant infected and 50 per cent and 35 per cent, respectively, of plants killed by the disease.

OHIO, INDIANA, IOWA: Recent information from H. C. Young, G. M. Smith and R. H. Porter indicates that the disease is very much less serious in Ohio, Indiana, and Iowa, than during the past two seasons.

OCCURRENCE OF PEACH MOSAIC IN COLORADO

Peach mosaic has been found by E. W. Bodine, Assistant Botanist, Colorado Agricultural Experiment Station, May 14, 1934, in the Palisades district, Mesa County. Statement of identity was confirmed by Dr. Lee M. Hutchins, Senior Pathologist, U. S. Department of Agriculture, Fort Valley, Georgia, on June 19, 1934.

This is the second time "peach mosaic" has been reported. This virus disease of peach was first reported and described by Dr. Hutchins from Texas. However, this is the largest infestation to date. Orchards range from one per cent to practically 100 per cent of affected trees. The Palisades district proper has the heaviest toll of affected trees, but the disease is now scattered in the outlying districts of Vineland, Orchard, Mesa, and Clifton. Work on eradication is in progress. (E. W. Bodine, July 30).

DOWNY MILDEW ON THE CALIFORNIA WILD GRAPE

C. Emlen Scott

Downy mildew caused by Plasmopara viticola has been found in abundance this season on the California wild grape, Vitis californica. It has been observed wherever I have examined vines along the Russian River and other streams in Sonoma and Mendocino Counties, and at one place on the Sacramento River in Sacramento County and on the Stanislaus River in Stanislaus County.

Downy mildew has never been reported on cultivated grapes in this State. Cultivated European varieties growing near infected wild vines have been examined at many places but no downy mildew has been found. This is apparently the first time grape downy mildew has been observed in California since it was collected by Dr. Harkness in 1889.

WINTER INJURY TO APPLES IN MAINE VERY SEVERE

Donald Folsom contributes the following statement concerning winter injury in Maine (Aug. 6):

In the Plant Disease Reporter, Vol. 18, No. 4, P. 34, there was an item about winter injury in Maine (this note should all have been credited to A. K. Gardner, not, as it was, partly to Donald Folsom). The following data are taken from a survey of winter injury in Maine made by the State Department of Agriculture, as published by the Agricultural Extension Service

Eight hundred and seventy-nine commercial orchards surveyed, containing about 430,000 trees of bearing age and 80,000 younger trees.

Condemned as not worth maintaining, due to winter injury, over 166,000 or about 39 per cent of the bearing trees and over 4,000 or about 6 per cent of the young trees.

Estimated crop for 1934 in 735 of these orchards is 95,000 barrels or only 36 per cent of the average annual crop secured in 1932 and 1933.

In the future, 26 per cent of the surveyed orchards will not be replanted and another 32 per cent will be replanted only if aid is secured from a government fund.

Therefore the loss this year is about 170,000 barrels. Much of this loss is permanent due to loss of the trees.

TOMATO PHYTOPHTHORA FRUIT ROT PRESENT IN GREENHOUSES IN NEW YORK

During the last week in May several growers of hot house tomatoes in the Irondequoit district near Rochester, New York, were bothered by a fruit rot occurring on the first brace of tomatoes. The plants were in ground beds and apparently the fungus (Phytophthora terrestris) was splashed up on the young green fruits where it causes a shiny brown to black rot neither wet nor dry. No stem rot or leaf blight was observed even in rows where a fairly high (20) percentage of the plants bore diseased fruits.

This disease is usually present to some extent in several houses on the first and sometimes second cluster of fruits. But after these are picked no more symptoms are ever observed on that season's crop. Growers never practice spraying or dusting tomatoes except sometimes in the seed bed. (A. G. Newhall, Aug. 2).

RUST OF GARDEN PEAS IN MASSACHUSETTS

What seems to be the first report of Uromyces fabae (Pers.) D.By. from New England has been received, with specimens, from O. C. Boyd, who observed a light scattering infection in a field of garden peas in East Longmeadow, Massachusetts, on July 9. The owner was making the last picking at that time. The center of infection comprised two or three heavily diseased plants. Leaflets, petioles, and stems showed many typical rust pustules containing both the uredinial and telial stages.

OBSERVATIONS ON VEGETABLE DISEASES IN TENNESSEE

Paul R. Miller sends the following report of his observations in Tennessee (Aug. 5). The estimates were made by actual counts of portions of the fields.

The most conspicuous thing about diseases on potatoes in Cumberland County, including 50 acres at the Cumberland Homesteads, was their almost complete absence. Black leg (Bacillus phytophthorus) on a few plants, and very scattered amounts of mosaic (virus) were all that were observed. An excellent growing season and the extensive use of certified seed may help to explain this condition. The leaf hopper was very severe in 7 acres at the Cumberland County relief gardens.

At the Cumberland Homesteads, 75 per cent of black rot (Bacterium campestre) was found in a 2-acre field of Charleston Wakefield cabbage and 35 per cent in another 2-acre field of Danish Ballhead. In 5 acres of Tennessee Greenpod beans there was 50 per cent of mosaic. A quarter acre of cucumbers showed 90 per cent infection with leaf blight (Macrosporium cucumerinum).

In the Cumberland County relief gardens 5 acres of cabbage had 20 per cent black rot.

In the TVA gardens at Norris 95 per cent of black rot was found in 3 acres of cabbage.

SOME REPORTS ON PLANT DISEASES IN MASSACHUSETTS

Reported by O. C. Boyd, (Received Aug. 4).

APPLE: Scab (Venturia inaequalis). Apple scab varies greatly in severity. It is most pronounced in orchards where lime-sulfur was not used in the calyx spray and (or) where the second cover spray was not applied until after the rainy period of June 18 to 19.

Blight (Bacillus amylovorus) is as prevalent in the Connecticut Valley this summer as in 1933. The twig blight stage this year, however, is more pronounced than the blossom blight stage. The reverse was true last year.

RASPBERRY: Anthracnose (Elsinoe veneta). Girdled and killed 1934 canes of red variety, resulting from severe infection when canes were very young; Amherst.

Winter injury. Several reports and specimens during the month of dying of 1934 canes due to injury at base of cane or at the crown or in the roots, or in all three. The dry weather of the month brought out the winter injury symptoms very prominently.

TOMATO: Bacterial canker (Aplanobacter michiganense): Advanced stage of the disease was observed in 90 per cent of the plants in that

portion of a field in West Springfield that was planted from plants growing in a neighbor's hot bed; and no disease in the other part of the same field set from plants grown from the same seed but on the grower's own farm. Hence, evidence that the neighbor's contaminated hotbed soil was the source of the disease rather than the seed.

Early blight (Alternaria solani). - Two-thirds of leaves dead from this disease observed in a Worcester field on July 18, and none of the fruits beginning to turn yet. No applications of dust or spray were made following setting of the field.

SUMMER SQUASH: Scab (Cladosporium cucumerinum): Moderate leaf and fruit infections observed in East Longmeadow on July 19; heavy infections in Montague on July 19. Rather early in the season for such pronounced infection of the fruits.

ELM: Specimen of elm wilt and die back sent from Gardner diagnosed by the Dutch Elm Disease Laboratory as caused by Cephalosporium sp.

WINTER INJURY: Many instances of wilting and dying-back of twigs and branches of various trees and shrubs were either observed or reported during the month, caused apparently by shortage of water in plants with winter injured branches, trunks, or roots.

A HEATH RUST NEW TO THE UNITED STATES

A specimen of Erica in cultivation at Colma, California, observed by G. L. Stout on July 12, 1934 to be infected by a rust was submitted for identification of the fungus which is referred tentatively to Uredo ericae Naumann. (Naumann, A. - Jahresb. d. Vereinig. f. Angew. Botanik 9:207-211, fig. 4 (1911) 1912).

No authentic specimen of this species is available for comparison. It was described from material on cultivated plants at Dresden in Germany, and seems otherwise unknown. A similar fungus, Thecopsora fischeri Cruchet, (Cruchet, P. - Bull. Soc. Vaud. Sci. Nat. 51:77-79, fig. 2-4, 1916), described with slightly smaller uredospores on Calluna from Switzerland, has been reported by Gonzalez-Fragoso (Gonzalez-Fragoso, R. - Fl. Iberica-Uredales 2:271-272, fig. 134, 1925) upon Erica in Spain. Cruchet's species is said to have minutely echinulate uredospores 19-23 x 13-17 μ. According to Naumann's description, his fungus has similar but larger uredospores, 28-32 x 19-24 μ. Sydow (Sydow, P. & H. - Monog. Ured. 4. p. 439, 1923) gives the dimensions as 18-28 x 15-22 μ, more closely approximating those of the California specimen which measure 21-27 x 15-22 μ.

It may be noted that in the Mycological Collections of the Bureau of Plant Industry there are two specimens of a rust on Erica from Spain leg. P. Unamuno in 1920, which were identified by the late Dr. Gonzalez-Fragoso as Thecopsora fischeri but which appear to be identical with the California specimen. The rust in California is doubtless an introduction with the host since it is not recognized among known American species upon other Ericaceous hosts, but until its taxonomic relations are better understood its genesis is problematical.

A part of Dr. Stout's specimen has been examined by Mr. George B. Cummins who also considers the rust to be Uredo ericae Naumann. (William W. Diehl).

OBSERVATIONS ON THE SIGNIFICANCE OF WEEDS AS CARRIERS OF THE BULB OR STEM NEMATODE IN NARCISSUS PLANTINGS

Grace Sherman Cobb and G. Steiner, Bureau of Plant Industry,
F. S. Blanton, Bureau of Entomology and Plant Quarantine.

Knowledge of the extent to which weeds are hosts and carriers of the bulb or stem nematode in narcissus plantings is of much practical value because: first, weeds may carry the disease over from one season to the next even though the infested bulbs have been eliminated or given the regular hotwater treatment; second, they may interfere with cultural control methods, for example, making crop rotation a failure as a means of starving out a soil infestation; third, they may be a constant source of danger in spreading the disease by seeds (dandelion, false dandelion, etc.) or other infested parts (leaves, stems, etc.) which may be disseminated by wind, implements, compost, etc.

From a theoretical point of view, observations of the kind here described furnish facts concerning the problem of host specificity, the development of so-called biologic races, the problem of the species, etc. Some investigators have claimed that the narcissus form of the bulb or stem nematode (Anguillulina dipsaci (Kühn 1858) is so highly specialized that not even hyacinths are definitely attacked, the form being therefore a highly specialized biologic race restricted to narcissus. This led those investigators to rather far-reaching practical conclusions, for example, suggesting the quarantine restrictions on infested narcissus as unnecessary so far as a possible transfer of the disease from narcissus to other hosts was concerned. The observations here reported, however, suggest conclusions quite at variance with these views.

At the Bureau of Entomology and Plant Quarantine Field Laboratory for Bulb Insects at Babylon, Long Island, a slight infestation with the bulb or stem nematode became evident on a plot about 90 x 120 feet planted in 1930 to narcissus. In the fall of 1932 this whole plot was replanted with some 15,000 narcissus bulbs of the Sea Gull and Campernelle varieties known to be infested with this same nematode. This planting was made for the purpose of providing a supply of infested material for experimental work. The rows were kept close. In 1933 the bulbs were dug and then a part of them replanted, and a few hundred bulbs of the variety Sir Watkins added. Weeds were allowed to grow. In June, 1934, a survey of these weeds was made, including those growing just outside the plot. Samples of all species found were carefully examined for the presence of the bulb or stem nematode with the following results:

A total of 40 species (including 3 tree seedlings, one of which was infested) grew in the plot (32 species) or near it (8 species). Of this total of 40 plant species 29 were infested with this nematode. Of the 11 in which none were found, only 3 were taken from within the plot. Therefore 29 out of 32 plants (or about 91 per cent) growing as weeds on the plot harbored Anguillulina dipsaci. Of these 29 infested plants, 21 have not been previously reported as hosts of this nematode.

List of Infested Plants

Identifications of the listed plants were checked by Dr. S. F. Blake and Dr. A. S. Hitchcock; the common names were furnished by Mr. O. M. Freeman, all of the Bureau of Plant Industry.

* indicates new host; • indicates host not previously reported from this country.

+ 1. AGROPYRON REPENS (L.) BEAUV., Quackgrass.
* 2. AMBROSIA ELATIOR L., Ragweed.
+ 3. CHENOPODIUM ALBUM L., Lambsquarters.
* 4. CHRYSANTHEMUM LEUCANTHEMUM L., Oxeye daisy.
* 5. DIGITARIA SANGUINALIS (L.) SCOP., Crabgrass.
* 6. ERECHTITES HIERACIFOLIA (L.) RAF., Burnweed.
* 7. ERIGERON CANADENSIS L., Horseweed.
+ 8. FAGOPYRUM VULGARE HILL, Common buckwheat.
* 9. GALINSOGA PARVIFLORA CAV., Quickweed.
*10. LACTUCA CANADENSIS L., Wild lettuce.
*11. LEPIDIUM VIRGINICUM L., American peppergrass.
*12. LINARIA CANADENSIS (L.) DUMORT, Oldfield toadflax
*13. LINARIA VULGARIS HILL, Butter-and-eggs.
*14. MOLLUGO VERTICILLATA L., Carpetweed.
*15. OXALIS STRICTA L., Common yellow oxalis.
*16. PHLEUM PRATENSE L., Timothy grass.
 17. PLANTAGO LANCEOLATA L., Buckhorn plantain.
*18. PLANTAGO RUGELII DECNE., Plantain.
*19. POLYGONUM AVICULARE L., Knotweed.
+20. POLYGONUM CONVOLVULUS L., Cornbind.
+21. POLYGONUM PERSICARIA L., Ladysthumb.
*22. PRUNUS SP. probably PENNSYLVANICA L., Pin cherry.
+23. RAPHANUS RAPHANISTRUM L., Wild radish.
*24. RUMEX ACETOSELLA L., Sheep sorrel.
*25. RUMEX CRISPUS L., Curly dock.
*26. RUMEX OBTUSIFOLIUS L., Bitter dock.
*27. SOJA MAX (L.) PIPER, Soybean.
*28. TRIFOLIUM ARVENSE L., Rabbit clover.
 29. TRIFOLIUM REPENS L., White clover

List of Plants not found Infested

++ indicates known as host, but in the present case not found attacked.

1. ACER SP. probably RUBRUM L., Red maple.
2. ARCTIUM MINUS SCHK.
++3. CIRSIUM LANCEOLATUM (L.) HILL., Bull thistle.
4. MALVA ROTUNDIFOLIA (L.) HILL.
5. POA PALUSTRIS L.
6. PORTULACA OLERACEA L., Common purslane
7. ROBINIA probably PSEUDOACACIA L.
8. SOLIDAGO SP.
9. TRIFOLIUM AGRARIUM L.
++10. TRIFOLIUM PRATENSE L., Red clover.
11. VERBASCUM THAPSUS L.

From a practical point of view these observations emphasize again the importance of clean cultivation for the grower. The fact that the soybean was found infested with this nematode proves that this plant should be used as a cover crop where an infestation is known or suspected to occur in a planting.

From a more scientific viewpoint the observation of a narcissus population of the bulb or stem nematode of so marked a polyphagous character as here described is of great interest, since the narcissus, as mentioned above, has been claimed by some investigators to harbor only a highly specialized almost monophagous form of this parasite. A similarly polyphagous type of population of this nematode has been reported only once before, namely by Quanjer in Holland. He described a population attacking primarily Irish potatoes but in addition some 50 other hosts. Remarkable also is the fact that a host like red clover (Trifolium pratense) which so often suffers severely from the attacks of this nematode, was not infested here. This is a new and striking example of the complexity of the problem of host specificity in this nematode.

THE EARLY DEVELOPMENT OF DORMANT COLONIES OF PRE-ADULT ANGUILLULINA DIPSACI (KÜHN 1858) GERV. & V. BEN. 1859, IN NARCISSUS BULBS IN BRITISH COLUMBIA AND THE SIGNIFICANCE OF THEIR RESISTANCE TO HEAT

R. J. Hastings
Laboratory of Plant Pathology, Saanichton, B. C.

Dormant colonies of pre-adult nematodes were discovered on the margin of the basal plates of narcissus on July 26, less than two weeks after lifting. Previously we reported discovery of these colonies in the middle of August, six weeks after lifting of the bulbs, and owing to the resistance of these dormant pre-adults to high temperatures, especially when protected from moisture by the corky basal plates, we suggested that the treatment with hot water should be effected not later than four weeks after lifting when that is done as soon as the foliage dies down.

The early appearance of the colonies of dormant pre-adults this year may be due to the fact that the season is four weeks earlier than normal. The lifting of bulbs usually commences about the end of June. The early development of these pre-adults this year creates considerable uncertainty as to the effectiveness of bulb sterilization with hot water.

Fortunately the dormant pre-adults are not resistant to solutions of silver nitrate-potassium cyanide and this method of sterilization may prove to be the solution of the sterilization problem. As developed by the Dominion Laboratory of Plant Pathology, Saanichton, B. C., Canada, the bulbs are immersed in a solution of one-half pound silver nitrate and one and one-half pounts potassium cyanide per 100 gallons of tap water, in a sealed container, and a vacuum of 25 inches of mercury is created and released over the bulbs. Only small scale experiments have been conducted by us since the development of this method in 1932. Therefore, we hope that other stations in Washington and Oregon interested in the problem of bulb sterilization will collaborate by making a thorough test of this new method.